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THE GENERAL USE AND FUNCTIONING OF THE BAR CODE SCANNER IS DESCRIBED IN THIS DOCUMENT. ALSO GENERAL SETUP INSTRUCTIONS TO GET STARTED ARE DESCRIBED IN THIS DOCUMENT. FOR FURTHER INSTRUCTIONS CONSULT OPTICON OR YOUR LOCAL DEALER.

OPN2002 BLUETOOTH DEMO QUICK SETUP GUIDE

(Version RFG35315)

The OPN2002 terminal is supplied with a Bluetooth demo application that demonstrates its Bluetooth capabilities. Since the OPN2002 terminal does not have a display to display instructions nor has a keyboard to change the demo application implements a user interface that consists entirely of using just the 2 keys and reading barcodes. This brief setup guide describes the features as well as instructions to be able to use this demo application.

More product details, additional support or configuration options to your own preferences (by Universal menu book) will be updated at www.opticon.com

Information about how to install and use a Bluetooth stack on your remote device, like a PC or mobile device, please check the manual of your Bluetooth device.

Capabilities of the Bluetooth demo application (RFG35315)

The following features are currently supported:

- Connecting to a remote device (as master) and transmit its data using a Bluetooth virtual COM port (VCP)
- Making the OPN2002 connectable (as slave) and discoverable to allow a remote device to connect with the OPN2002 and allow the transmission of its data using a Bluetooth virtual COM port (VCP)
- Making the OPN2002 connectable (as slave) and discoverable as HID (keyboard) device to allow the remote device to connect with the OPN2002 and transmit its barcode data as Bluetooth keyboard device.
- Reconnecting to a paired remote device (as master) to quickly re-establish a lost Bluetooth HID connecting without having to re-enter a PIN code.
- (Limited) Opticon Universal menu book support to configure barcode decoders, pre- and suffixes, read modes, buzzer/LED settings, change Bluetooth configurations and switch between HID or VCP as Bluetooth interface.
- Possibility to configure a remote Bluetooth address and PIN code using barcodes
- Use of the trigger and clear key to connect, disconnect, make discoverable / connectable and reconnect.
- Storing of configurations in non-volatile memory to allow all settings to be restored after a reset.
- Configuration of the application by using Opticon serial commands
- Easy software upgrading by USB (VCP) or the CRD-2000 multi cradle (RS232) using Appload.
- iPhone / iPad compatibility

Configuring the Bluetooth demo application

Minimum required OS version

This demo application requires the following minimal OS version: RBGV0208. However, the recommended version is RBGV0220 due to a number of bug fixes and improved Bluetooth compatibility in the latest OS versions.
If you want to check the currently installed OS and application version it is possible to transmit both versions by USB-VCP by reading the 'Z1' menu label (See Universal menu book chapter 7). It's also possible to use Appload (Utilities > Show software version) to check the OS version.

Software updates

In the future more features and bug fixes are likely to be implemented into the OS of the OPN2002 and this application. To find out if there are software updates available, please check our web site. All available software and documentation for the OPN2002 can be found under:
'Service and support' > 'Software' / 'Manuals' > 'OPN2002' at www.opticon.com.

Supported defaults

The following default settings are supported.
(*The labels below can be read without reading any SET/END labels)*

Bluetooth VCP * ***(default)***	
Bluetooth HID *	

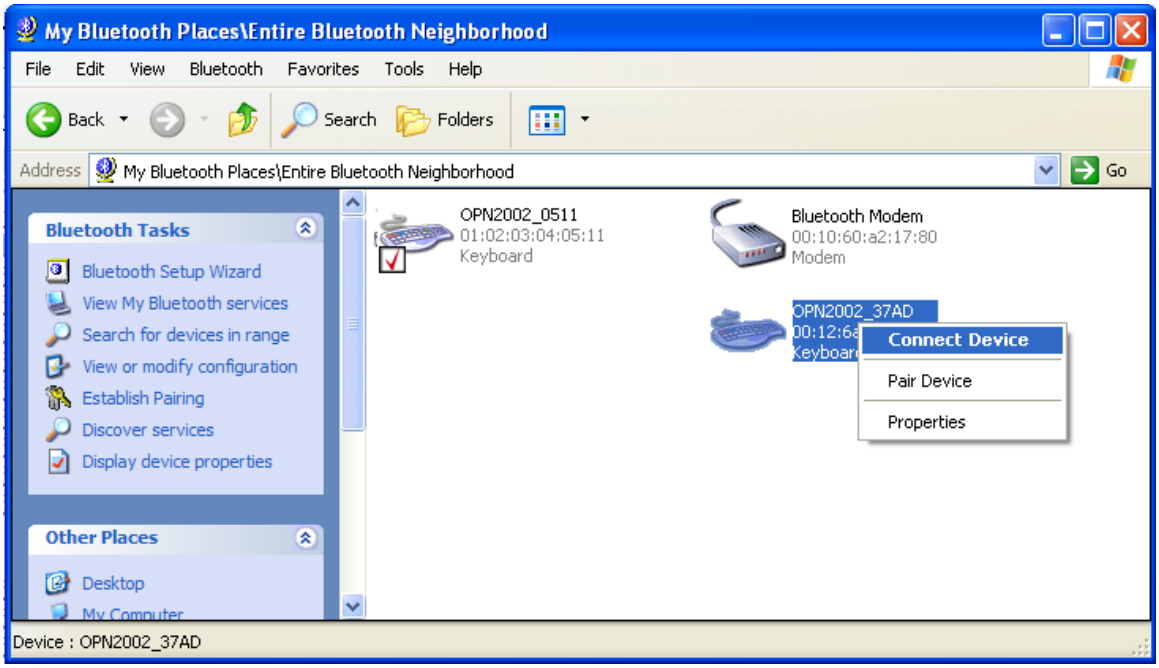
** If you only have a Opticon Universal menu book available which doesn't list 'C02' or 'C05' as supported defaults, it's possible to use RS232 ('U2') or Bluetooth ('SO') instead of 'C05' and USB-HID ('SU') instead of 'C02'.*

Connecting your OPN2002 as Bluetooth keyboard (HID)

The first step of connecting your OPN2002 as Bluetooth keyboard to a remote device is to make sure the Bluetooth HID default is configured (see 'Supported defaults').

When using Bluetooth HID, the remote device always has to make the first connection attempt. Therefor it is not necessary to configure the remote Bluetooth address, but you will have to make your OPN2002 discoverable and connectable to allow the remote device to find, pair and connect to your OPN2002.

To make your OPN2002 discoverable and connectable (for 2 minutes) keep the small clear key pressed for 5 seconds till the blue LED starts blinking. When this is done, let your remote device discover all Bluetooth devices in range to find your OPN2002.



Print screen of an OPN2002 that has been discovered on a remote PC.

After you've discovered your OPN2002 you can try to let your remote device connect with your OPN2002.

Depending on your Operating System and Bluetooth stack you will either be asked to enter any PIN code on your remote device or you will be shown a random PIN code. Either way you will be requested to enter that same PIN code on your OPN2002.

If you are allowed to enter any PIN code, then it is easiest to choose the last 4 digits of the Bluetooth address of your OPN2002 as PIN code since that is the default PIN code of your OPN2002. To skip having to enter a PIN code on your OPN2002 read the 'Fixed PIN code' label below to configure this. To change this configuration back to default again (= entering the PIN code manually) you can read the other label.

] EPIN

Use fixed PIN code

] MPIN

Enter PIN code manual
(using numeric direct input labels)

If you want to use a different PIN code or you are only allowed to enter a random PIN code on your OPN2002, then you will have to enter this PIN code using direct input labels. These labels can be found in the universal menu book (or below). After entering the PIN code read the END label to send the PIN code to the remote device.

Direct input numeric 0		Q0
Direct input numeric 1		Q1
Direct input numeric 2		Q2
Direct input numeric 3		Q3
Direct input numeric 4		Q4
Direct input numeric 5		Q5
Direct input numeric 6		Q6
Direct input numeric 7		Q7
Direct input numeric 8		Q8
Direct input numeric 9		Q9
END		

When executed correctly your OPN2002 should now be connected as keyboard and you should be allowed to scan and transmit barcodes as keyboard data. If the remote device does establish the pair, but doesn't automatically connect, you might have to manually connect afterwards by pressing the trigger key for 5 seconds.

To manually end a connection you can press the small clear key for 5 seconds to disconnect your OPN2002.

If you've lost your connection, then the OPN2002 will try to reconnect automatically for about 1 minute, but if that fails you can reconnect manually by pressing the trigger key for 5 seconds. The trigger key allows you to reconnect without having to enter the PIN code again as long as the remote device doesn't lose the pairing information and the OPN2002 wasn't reset to default or the remote Bluetooth address was changed.

If the pair was ever lost or you want to connect to another remote device you will have use the clear key again to make your OPN2002 connectable and allow the remote device to connect and pair with your terminal.

Connecting your OPN2002 as a Virtual Com port (VCP)

The first step of connecting your OPN2002 as Bluetooth Virtual Com Port to a remote device is to make sure that Bluetooth VCP default is configured (see 'Supported defaults').

When using Bluetooth VCP, the remote device can either connect to your OPN2002 (slave mode) or your OPN2002 can connect to remote device (as master).

Configuring a remote Bluetooth address

If you want the OPN2002 to connect to a remote device (as master) it will be necessary to configure the Bluetooth address of the remote device first.

Usually the address is displayed on the product label as a hexadecimal code (example: 00-11-F6-03-39-69). Otherwise consult the documentation of the device to learn how to retrieve the Bluetooth address. To configure this Bluetooth address in the OPN2002 you'll have to create a barcode label containing this hexadecimal code as described below.

Opticon provides a simple on-line application on for this purpose:

http://opticonfigure.opticon.com/bluetooth.asp

- Type in the digits of the hexadecimal code in numbers and capital characters without dashes, dots and spaces (example: 0011F6033969).
- Submit the code into a barcode and print the screen to have it available for scanning.

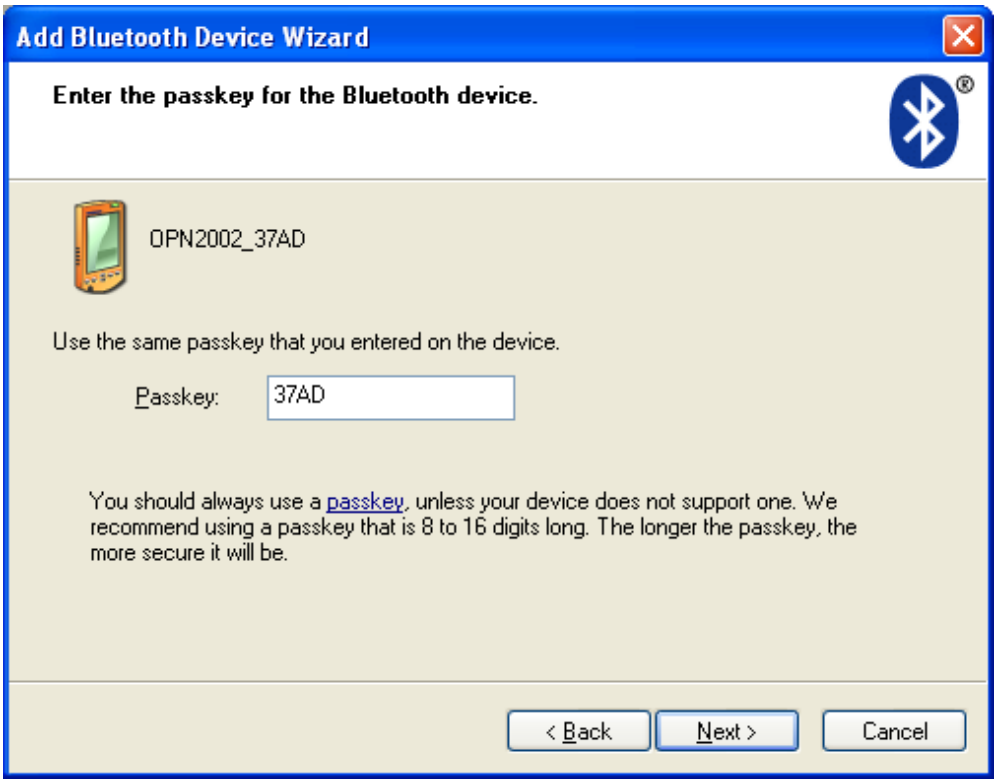
After you've created the barcode, you can scan the barcode to configure the Bluetooth address and save it in non-volatile memory. (The OPN2002 will automatically try to establish a Bluetooth connection when reading this label).

Connect as master

Depending on the Operating System and Bluetooth stack of your desktop computer, laptop or mobile Bluetooth device, it is necessary to first open the (incoming) Bluetooth Virtual Com port, before you will be able to connect your OPN2002 as master to your device. Using applications like Hyperterminal or the RS232 monitor of Appload it is possible to open the Bluetooth Virtual Com Port. For more information on how to open a COM port, please refer to documentation of your remote Bluetooth device.

The first time you try to connect your OPN2002 to a Bluetooth device you will have to scan the created Bluetooth address label. After that, it will also be possible to do a connection attempt by pressing the trigger key for 5 seconds (until the blue LED starts blinking).

If you haven't disabled authentication on your remote device, then you will be requested to enter a PIN code (or passkey). The default PIN code of the OPN2002 equals the last 4 digits of the Bluetooth address. These last 4 digits of the Bluetooth address are also shown in the Bluetooth name of the OPN2002. If you wish to use a different PIN code, then this is possible by using the 'Set/end PIN-code label' menu options, which can be found in chapter 2.3.2 of the Universal menu book.


Add Bluetooth Device Wizard
Enter the passkey for the Bluetooth device.
OPN2002_37AD
Use the same passkey that you entered on the device.
Passkey:
37AD
You should always use a passkey, unless your device does not support one. We recommend using a passkey that is 8 to 16 digits long. The longer the passkey, the more secure it will be.
< Back
Next >
Cancel

Example of a request on a Windows device to enter a passkey (a.k.a. PIN-code)

When executed correctly your OPN2002 should now be connected as Virtual Com port to your remote device and you should be able to scan and transmit barcodes as serial data.

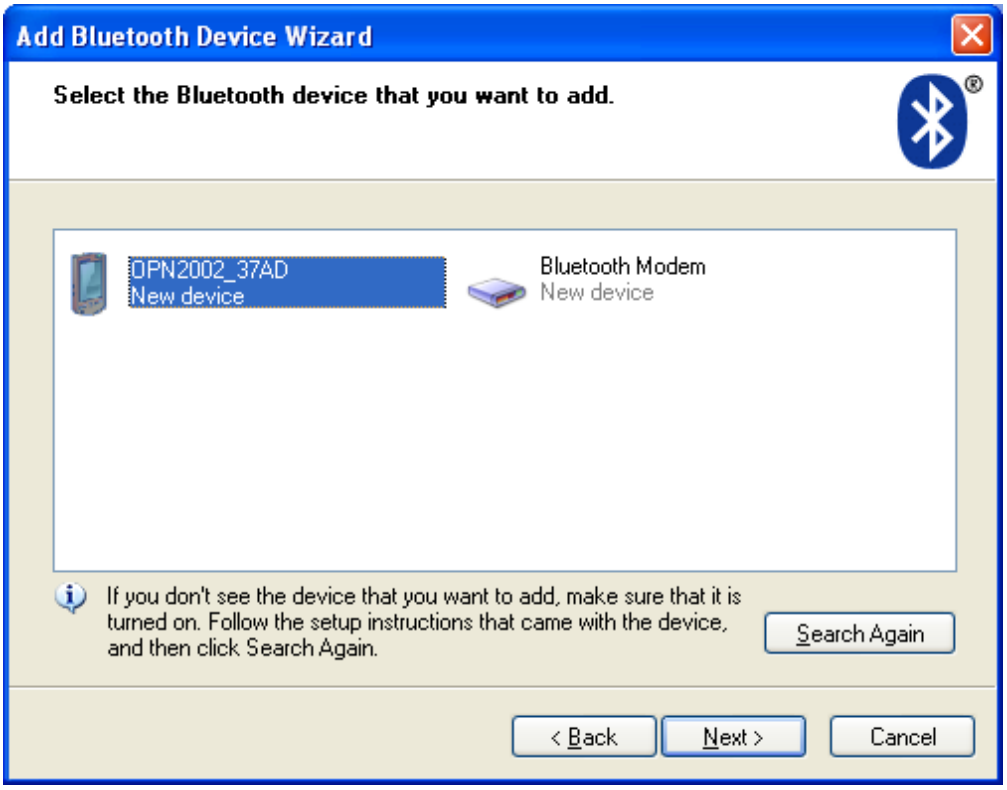
If you've lost your connection or closed the virtual com port, then the OPN2002 will try to reconnect for about 1 minute. After that you can reconnect manually by pressing the trigger key for 5 seconds. To change this auto reconnect time, use the menu options found in chapter '2.3.6 Auto reconnect options' of the Universal menu book.

To manually end your connection you can press the small clear key for 5 seconds to disconnect your OPN2002.

Connect as slave

When you want a remote Bluetooth device to connect with your OPN2002, then it is not necessary to configure the remote Bluetooth address, but you will have to make your OPN2002 discoverable and connectable to allow the remote device to find and connect to your OPN2002.

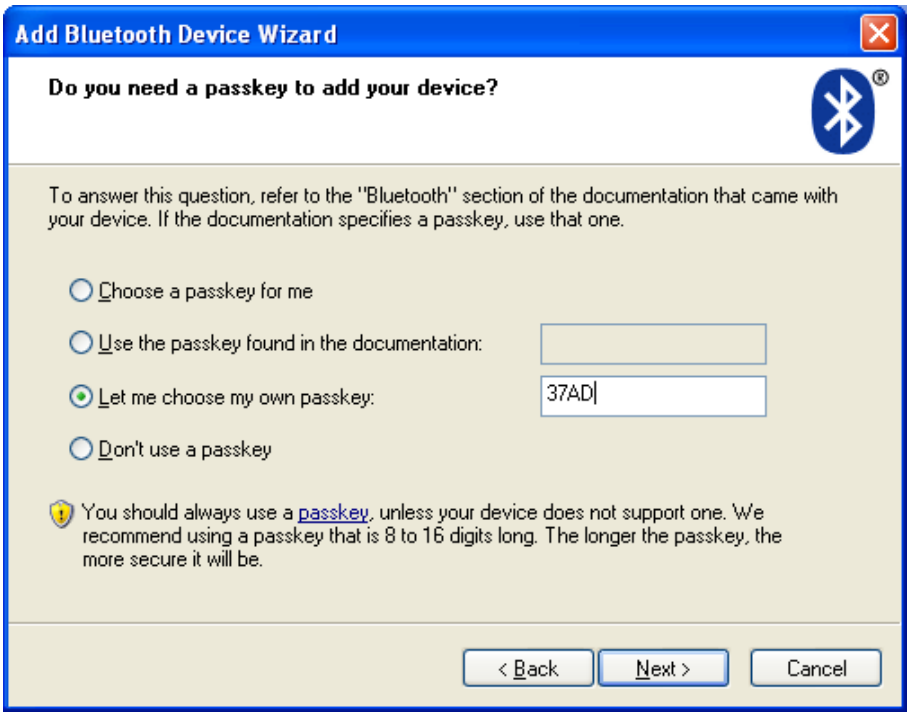
To make your OPN2002 discoverable and connectable for 2 minutes, keep the small clear key pressed for 5 seconds until the blue LED starts blinking. After that you should let your remote device discover all Bluetooth devices in range to find your OPN2002.


Add Bluetooth Device Wizard
Select the Bluetooth device that you want to add.
OPN2002_37AD
New device
Bluetooth Modem
New device
If you don't see the device that you want to add, make sure that it is turned on. Follow the setup instructions that came with the device, and then click Search Again.
Search Again
< Back
Next >
Cancel

Screenshot of discovered Bluetooth devices.

After you've successfully discovered your OPN2002 you can try to let your remote device pair with your OPN2002.

If you haven't disabled authentication on your remote device, then you will be requested to enter a PIN code (or passkey) on your remote device. The default PIN code of the OPN2002 equals the last 4 digits of the Bluetooth address. These last 4 digits of the Bluetooth address are also shown in the Bluetooth name of the OPN2002. If you wish to use a different PIN code, then this is possible by using the 'Set/End PIN-code label' menu options, which can be found in chapter 2.3.2 of the Universal menu book.


Add Bluetooth Device Wizard
Do you need a passkey to add your device?
To answer this question, refer to the "Bluetooth" section of the documentation that came with your device. If the documentation specifies a passkey, use that one.
Choose a passkey for me
Use the passkey found in the documentation:
Let me choose my own passkey:
37AD
Don't use a passkey
You should always use a passkey, unless your device does not support one. We recommend using a passkey that is 8 to 16 digits long. The longer the passkey, the more secure it will be.
< Back
Next >
Cancel

Screenshot of entering a passkey (a.k.a. PIN-code) on a Windows device

If successful, the OPN2002 should now be successfully paired with your remote Bluetooth device and the Virtual Com port ready to be used.

To be able to scan and transmit barcodes as serial data, open the Bluetooth Virtual Com port on your remote device to establish the connection with the OPN2002

If you've lost your connection or closed the Virtual Com port, then the OPN2002 will stay connectable for about 2 minutes*. After those 2 minutes, use the small key to make the OPN2002 connectable again and allow the remote device to re-establish the connection.

To manually end your connection, press the small clear key for 5 seconds to disconnect your OPN2002.

** The labels below allow you to change the time that the OPN2002 will stay connectable*

CT02	**Discoverable/connectable time: 2 minutes**
CT04	Discoverable/connectable time: 4 minutes
CT06	Discoverable/connectable time: 6 minutes
CT08	Discoverable/connectable time: 8 minutes
CT10	Discoverable/connectable time: 10 minutes

Limited Universal menu book support

In contrary to other Opticon programmable terminals, the OPN2002 also supports the reading of various configuration options that can be found in the Universal menu book. This makes it possible to customize this application without having to actually change the source code of this application.

The OPN2002 support (most of the) menu options listed in the following chapters:

- 1. Defaults (See chapter 'Supported defaults' at the start of this set-up guide)
- 2.3. Bluetooth options (See 'Supported Bluetooth features' below)
- 3.1 Enabling/disabling readable codes
- 3.2 Setting of fixed, minimum and maximum lengths
- 3.3 Code specific options (almost all options are supported except some 2D decoder options)
- 4.1 Case conversion
- 4.2 Set prefixes
- 4.3 Set suffixes
- 5.1 Read modes, add-on wait modes
- 5.1.1 Multiple read reset time
- 5.1.2 Quite zone options (margins)
- 5.2. Read time options
- 5.4 Redundancy
- 5.5 Positive and negative barcodes
- 6.1 Buzzer settings
- 6.2 Good read LED
- 7.1 Diagnostics
- 7.2 Enabling / disabling configuring via serial commands

Supported Bluetooth features

In the Opticon Universal menu book there are additional Bluetooth features listed for Opticon barcode readers with Bluetooth support. Some of these features are also available on this demo application.

The following of these listed features are supported:

- Chapter 2.3.1: Bluetooth connection labels
  - +-CONN-+ (Manually connect label)
  - +-DISC-+ (Manually disconnect label)
  - +-DSCO-+ (Make discoverable / connectable)
- Chapter 2.3.2: Bluetooth security (Authentication / encryption)
- Chapter 2.3.3: Configurable Trigger-to-connect time (default = 5 seconds)
- Chapter 2.3.4: Configurable Trigger-to-disconnect time (default = 5 seconds)
- Chapter 2.3.6: Auto reconnect options (default = 1 minute)
- Chapter 2.3.7: Wireless power saving options

Apple iPhone/iPad support

Requires RFG35315 with OS version RBGV0220 or higher. When iPhone/iPad mode is enabled it's possible to toggle the onscreen keyboard and use the trigger key to wake up the iPhone/iPad from standby. It is recommended to disable the passcode lock option to prevent barcodes from being entered as passcode when waking up from standby.

Enable iPhone/iPad mode

Disable iPhone/iPad mode

Read one of the labels above to enable/disable iPhone compatibility.

MEMORIZING

This application does not support memorizing of barcodes in case the OPN2002 loses its connection with a remote Bluetooth device.

If memorizing is desired, it's possible to load the main application of the OPR3301 (RGJ3553x) on the OPN2002, which does support memorizing. This application can be found at:

'Service and support' > 'Software' / 'Manuals' > 'OPR3301' at www.opticon.com.

Note: The minimum required OS version for memorizing is RBGV0216.

Other OPN2002 applications

Besides this Bluetooth demo application there are 3 other OPN2002 applications available on our web site that might fit your specific application better.

1. Software V35106: OPN2001 simulation demo application

This application turns the OPN2002 into an OPN2001 compatible batch scanner.

Besides USB, any stored barcode data can also be retrieved from the OPN2002 by using Bluetooth.

Use this OPN2002 application in combination with the OPN2001 Demo application for Windows (or develop your own application using the SDK that's available for the OPN2001).

Note: When planning to use the OPN2002 solely as on standard OPN2001, so without Bluetooth or need to run other applications, please note the following (hardware) differences:

- The battery of the OPN2002 empties quicker than the battery of the OPN2001 when rarely used. Approximately the OPN2002 can operate normally for about 30 days when it's rarely used.
- The OPN2002 does not support laser aiming (laser dot)
- The OPN2002 can not change its scan angle to shorten the laser line
- Unlike the OPN2001, the OPN2002 will lose its time and date within 4-5 days after the OPN2002 becomes non-operational due to an empty battery, which is sooner than the OPN2001. When this occurs, this will cause the time to be reset to 1-1-1970 00:00. If the OPN2002 isn't regularly used, it might be necessary that, before retrieving any barcode data, the current time is read from the OPN2002. If the retrieved time doesn't match the time of the PC, then the correct time can be send to the OPN2002 and incorrect time/date stamps of barcode data can be corrected using the difference between the time of the OPN2002 and the PC.

2. Software V35412: Batch demo application (USB & CRD-2000 multi-cradle)

This software turns the OPN2002 into a batch scanner that can transmit it data as a file by either USB or the CRD-2000 multi-cradle.

Use this application in combination with the NetO32 Windows application.

The output format of the barcode file (comma separated) can be configured using the set-up chart that can be found in the included manual.

Note: Application source code is publicly available for editing using the SDK

3. Software V35531: OPR3301 main Bluetooth application

This application has been developed for the OPR3301 barcode scanner, but it also compatible with the OPN2002.

This application is very similar to the application described in this manual, but supports more of Bluetooth options that are listed in the Universal menu book.

This application is recommended when the OPN2002 is used as replacement for the old OPL2724 / OPL7724 and when memorizing of barcodes is desired if the OPN2002 lost its Bluetooth connection or is out-of-range.

Notes:
- *This application can be found in the download section of the OPR3301.*
- *No source code will be available for editing*

Trouble shooting

Since the OPN2002 doesn't have a display, it also doesn't have a system menu to resort to when a crashing application or OS prevents you from loading new software on the OPN2002.

For this reason the OPN2002 has a few escape mechanisms to allow you to restart, halt your application and/or install new software. This can be very useful in case the OPN2002 has crashed or is constantly restarting due to a crashing application.

Restart mechanisms

Automatic	The OPN2002 has a watchdog timer to determine whether the OS is still running or has crashed. This watchdog will cause the OPN2002 to restart after 3 seconds if the OS has crashed. This watchdog timer will not cause a restart when only the application has crashed. Since OS version **RBGV0220** the software of the OPN2002 is also protected against electrical static discharges (ESD). If the OPN2002 has stopped working due to an ESD it will automatically recover within a minute.
Manually	The OPN2002 has a manual restart mechanism that allows you to restart in situations that the OS is still running, but your the application has crashed. In order to activate this mechanism, press and hold the trigger or delete key for at least 20 seconds. After the OPN2002 has sounded the restart beep, you can release the key to complete the restart.

Halting your application

- Firstly, make sure your battery isn't empty and your mini-USB cable is not connected to the OPN2002.
- Then restart your application using one of the two restart methods listed above, while keeping the trigger key pressed.
- While keeping the trigger key pressed, insert the mini-USB cable into the OPN2002 to halt the application.

If successful, the LED of your OPN2002 should now be blinking orange. You should now be able to load new application or OS software.

Halting the Operating System (only necessary in case a corrupt OS is installed)

- Firstly, make sure your battery isn't empty and your mini-USB cable is not connected to the OPN2002.
- Then restart your application using one of the 2 methods listed above, while keeping the delete key pressed.
- While keeping the delete key pressed, insert the mini-USB cable into the OPN2002 to halt the Operating system.

If successful, the LED of your OPN2002 should now be blinking red. You should now be able to load a new OS.

Version history *

RFG35310	First release	October 10th, 2009
RFG35311	Bug fixes and following new featues: - configurable auto reconnect time - configurable trigger to (dis)connect time - support of connect/disconnect labels	October 20th, 2009
RFG35312	Added following features: - configurable read mode / read time - configurable buzzer options - configurable good read LED options - serial command support - Added a retry to a connection attempt - Made the reconnect attempt cycle faster	January 18th, 2010
	- Manual update - Added information about memorizing features - Added list of other OPN2002 applications - Added trouble shooting section	May 20th, 2010
RFG35313	- Manual update - configurable connectable time - fixed reconnect time in SPP slave mode	July 30th, 2010
RFG35314	- Added option to toggle iOS on screen keyboard when connected to an iPhone (Requires OS RBGV0216 or higher)	November 1st, 2010
RFG35315 (with OS version RBGV0220)	- Manual update - Software protection against ESD - Automatic wake-up of iPhones using the trigger key - Fixed repeating character bug (i.e. carriage returns) on iPhones/iPads	February 22nd, 2011

** Bug fixes and added features in the Operating System of the OPN2002 are not listed in the application version history above.*

Please check our web site at www.opticon.com to see if there are updates available for the Operating System, this application and this manual.